A GLOBAL PERSPECTIVE ON GROWING THE BIOECONOMY

MALAYSIA: HUB FOR INDUSTRIAL BIOTECHNOLOGY LINKAGES ACROSS THE WORLD

PACIFIC RIM SUMMIT ON INDUSTRIAL BIOTECHNOLOGY & BIOENERGY
9 DECEMBER 2014
BIOTECHCORP
NURTURE AND ACCELERATE GROWTH OF MALAYSIAN BIOTECHNOLOGY INDUSTRY

As a Bio-industry Developer, we:

• Accelerate and enhance the growth of the Bio-Based Industry
• Planned and realize maximum value through strategic ventures
• Selectively forge ventures with ‘best-in-class’ global bio-based partners
• Create iconic hub of bio-based industry in Malaysia
• Offer truly exciting investment climate for visionaries and investors
MALAYSIA SETS A TARGET TO BECOME A HIGH-INCOME DEVELOPED NATION BY 2020

ENGINEERING & CONSTRUCTION

PALM OIL

AUTOMOTIVE

OIL & GAS, PETROCHEMICAL

ELECTRICS & ELECTRONICS

TIMBER & FURNITURE

STRATEGIC INDUSTRIES
NEW ECONOMIC MODEL WAS INTRODUCED TO ENABLE SUSTAINABLE ECONOMIC GROWTH & BECOMING A HIGH – INCOME NATION

USD15,000 GNI PERCAPITA BY 2020

HIGH – INCOME NATION

QUALITY OF LIFE

INCLUSIVENESS

SUSTAINABILITY

ENABLES ALL COMMUNITIES TO BENEFIT FROM THE WEALTH OF THE COUNTRY

MEETS PRESENT NEEDS, WITHOUT COMPROMISING FUTURE GENERATIONS
TO ACHIEVE THE **HIGH – INCOME STATUS**, MALAYSIA NEEDS TO BE:

- **FOCUS**
- **COMPETITIVE**

Introduction of the **Bioeconomy Transformation Program** as the new economic icon for Malaysia by:

**SYNERGIZING THE OLEOCHEMICAL AND PETROCHEMICAL INDUSTRIES**
COMPARING MALAYSIA’S BIOECONOMY TO SELECTED ECONOMIES BASED ON CONTRIBUTION TO THE GDP

BIOECONOMY’S CONTRIBUTION TO THE NATION’S GDP
USD50 BILLION
HOW DO WE LEVERAGE ON THE AGRO & PETROCHEMICAL INDUSTRIES TO ADVANCE THE BIOECONOMY
By 2010 Asia was already generating a high share of global chemical market value. By 2010, Asia was generating 5% of the global chemical market value, corresponding to USD 0.1 trillion. The Rest of the World generated 7% (USD 0.2 trillion), North America 21% (USD 0.6 trillion), Europe 24% (USD 0.7 trillion), and Asia 43% (USD 1.2 trillion). The total global chemical market value in 2010 was USD 2.8 trillion.
The chemical industry will shift east by 2030.

- **USD 6.8 Trillion**
- **USD 4.0 Trillion**
- **USD 1.2 Trillion**
- **USD 2.8 Trillion**

Comparative data for 2010 and 2030 for Latin America, Rest of World, North America, Europe, and Asia.
PETRONAS RAPID: A CASE STUDY

MARKET VALUE
USD 10BIL

4 MILLION TONNES CHEMICAL PRODUCTS
PETRONAS RAPID: A CASE STUDY

3.5 MILLION TONNES

30% OF PRODUCTS CAN BE PRODUCED THROUGH BIO TECHNOLOGY

BIOMASS
PETRONAS RAPID: A CASE STUDY

USD 2.3 BILLION MARKET VALUE

C2: GLYCOL ETHERS UNIT
C3: PROPYLENE GLYCOL UNIT
C4: BUTADIENE EXTRACTION UNIT
  POLYBUTADIENE RUBBER UNIT
  ACRYLONITRILE BUTADIENE RUBBER UNIT
C5: ISOBUTYLENE EXTRACTION UNIT
C6: METHYL METHACRYLATE UNIT
C5/C6: BENZENE EXTRACTION UNIT
PHENOL UNIT

30% OF PRODUCTS CAN BE PRODUCED THROUGH BIO TECHNOLOGY
POTENTIAL BIOCHEMICAL MARKET SHARE IN SOUTH EAST ASIA (2030)
(The McKinsey Theory: 10% of chemical market share)

BIOCHEMICAL MARKET, 2030:
USD 100 BILLION

SOUTH EAST ASIA CHEMICAL MARKET, 2030:
USD 1 TRILLION
OIL PALM TREE: ‘A MULTI–PURPOSE TREE’

A UNIQUE FEEDSTOCK

Among the few feedstock of the world that is able to provide multi-platform feedstock for the industrial biotechnology industry:

- **BIOMASS & CELLULOSIC SUGAR**
  - 20 million dry metric tonnes of biomass per year from empty fruit bunches (EFB, and Oil Palm Trunks)
  - Potential cellulosic sugar production of 12 million metric tonnes per year

- **OIL & LIPIDS**
  - 20 million metric tonnes of Crude Palm Oil (CPO)

- **METHANE**
  - 1 Billion cubic meter of biomethane from the Palm Oil Mill Effluents (POME)
GLOBAL OIL & LIPIDS MARKET (2010)

- **Asia**: USD 114 Billion
- **North America**: USD 108 Billion
- **Latin America**: USD 140 Billion
- **Europe**: USD 52 Billion
- **Rest of World**: USD 23 Billion

**GLOBAL VEGETABLE OIL & LIPIDS MARKET VALUE (2010)**

USD 440 Billion
GLOBAL MARKET FOR OIL & LIPIDS FROM 2010 - 2030

LATIN AMERICA 35% 38%
REST OF WORLD 6% 7%
NORTH AMERICA 27% 25%
EUROPE 13% 13%
ASIA 26% 23%

USD 114 BILLION
USD 140 BILLION
USD 630 BILLION
USD 440 BILLION
SOUTH EAST ASIA MARKET FOR OIL & LIPIDS (PALM OIL) FROM 2010 - 2030

2010
USD 45 BILLION
38% of ASIA

2030
USD 60 BILLION
35% of ASIA
<table>
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<tr>
<th>STRENGTHS</th>
<th>CHALLENGES</th>
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<tr>
<td>WORLD CLASS COMPANIES &amp; CONGLOMERATES i.e. SIME DARBY, PETRONAS, FELDA, GENTING, IOI</td>
<td>LIMITED AREA FOR PLANTATION EXPANSION, FORCING PALM GROWERS TO VENTURE FURTHER DOWNSTREAM</td>
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<td>READY &amp; WELL-ESTABLISHED INFRASTRUCTURE, DEDICATED, CUSTOMIZED INDUSTRIAL PARKS</td>
<td>LIMITED TECHNOLOGY KNOW-HOW, WILL REQUIRE STRATEGIC PARTNERSHIP WITH TECHNOLOGY PROVIDERS</td>
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<td>ADVANCED ENGINEERING CAPABILITIES FROM BOTH PALM OIL &amp; THE PETROCHEMICAL INDUSTRIES</td>
<td>LIMITED EXPERIENCE IN SCALING UP BIO-BASED PROJECTS</td>
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<td>PROVIDE OPPORTUNITIES TO COMPLEMENT WITH THE STRATEGIC PROJECTS, i.e. PETRONAS RAPID, JOHOR &amp; PETRONAS GIPC, KUANTAN</td>
<td>VERY COMPETITIVE REGIONAL INVESTMENT LANDSCAPE</td>
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THE BIOCHEMICAL ECOSYSTEM IN MALAYSIA
(Synergizing Oleochemical & Petrochemical Industries)

NEW ACTIVITY

HIGH VALUE CHEMICALS

EXISTING ACTIVITIES

5.2 MILLION (HA) 430 MILLS 67 REFINERIES & OLEOCHEMICALS

OIL PALM PLANTATION PALM OIL MILLS PALM OIL REFINERIES

BIOCHEMICALS

EXISTING ACTIVITIES

1.4 MILLION BARRELS / DAY 6 REFINERIES 265 CHEMICAL MANUFACTURERS

CRUDE OIL PRODUCTION OIL REFINERIES CHEMICAL PRODUCERS
VALUE ADDITION TO PALM OIL INDUSTRY

Adoption of Biotechnology in Downstream Palm Oil Industry

USD PRICE/MT (000)

- FRESH FRUIT BUNCHES: 150
- CRUDE PALM OIL: 800 – 1,000
- PALM REFINERY PRODUCTS: 1,000 – 1,400
- BASIC OLEO PRODUCTS: 1,400 – 2,000
- SPECIALTY BIO CHEMICALS: 3,000 – 4,000

BIOTECHCORP
MALAYSIAN BIOTECHNOLOGY CORPORATION
Cluster Development in Key Economic Corridors

**BIOMEDICAL CLUSTERS**

1. Northern Region Medical Devices Cluster
2. Central Region BioMedical Clusters
3. Southern Biopharma Cluster
4. Sabah: Drug Development & Drug Discovery Cluster
5. Sarawak Drug Development & Drug Discovery Cluster

**BIOINDUSTRIAL CLUSTERS**

6. Northern Region Biomaterials Cluster
7. East Coast Region Kertih Biopolymer Park Oil and Lipid Cluster Biogas Cluster
8. Southern Region Johor BioXCell
9. Sabah POIC
10. Sarawak Corridor of Renewable Energy

**AGBIOTECH CLUSTERS**

11. Northern Region – Penang Science Park (Aquaculture)
12. Agro BioXcell – Cameron Highlands
13. East Coast Region Centre for Biotechnology & Herbal Products
14. Sabah High Impact Agriculture Centre - Kundasang
15. Sarawak Agarwood Industry
Major Global Players Recognise the Market Potential

Secured major investments demonstrate a shift toward these higher-value markets

- Developing world’s first bio-methionine plant and Asia’s first thiochemical platform using renewable bio-material feedstock in Kerteh Bio-Polymer Park

- Setting up the world’s first facility converting bio-isobutanol from cellulosic feedstock at the Kertih BioPolymer Park in Terengganu

- Establishment of first plant in the world to produce technical grade ethanol using crude glycerine in Bio-Xcell park, Johor

- Opening plant for production of dodecanedioic acid (DDDA), Sebacic acid and Adipic acid using renewable palm oil derivatives
THE INCENTIVES
INCENTIVES: THE ROAD TO PROFITABILITY

- Deduction on investment made into the company
- Tax deduction for tech acquisition
- Import duty exemption pilot plant
- 10 years tax exemption on statutory income
- Tax exemption on dividend repatriated
- Double deduction on export promotion
- Double deduction on R&D
- Concessionary tax rate of 20% for 10 years
THANK YOU

READY TO INSPIRE

COMMERCIALIZING INNOVATION IN BIOTECHNOLOGY